

CLAIMS

What is claimed is:

1. A load/unload disk drive, comprising:
 - a suspension arm;
 - a slider body coupled to the suspension arm, the slider body having a load pivot point, wherein the slider body comprises:
 - an air bearing surface; and
 - a first protrusion extending beyond the air bearing surface, the first protrusion being disposed on the slider body forward of the load pivot point; and
 - a securing mechanism configured to receive the suspension arm to load and unload the slider body.
2. The disk drive of claim 1, further comprising a disk having a data zone surface and wherein the protrusion maintains the slider body with a positive pitch attitude during contact between the slider body and the data zone surface of the disk.
3. The disk drive of claim 1, wherein the slider body has a mid point and wherein the first protrusion is disposed on the slider body forward of the mid point of the slider body.
4. The disk drive of claim 3, wherein the slider body has a leading edge and wherein the first protrusion is disposed on the slider body adjacent to the leading edge of the slider body.
5. The disk drive of claim 1, wherein the protrusion extends beyond the air bearing surface approximately 500 Angstroms or less.

6. The disk drive of claim 1, wherein the protrusion has a leading edge contour.
7. The disk drive of claim 1, wherein the slider body further comprises a second protrusion extending beyond the air bearing surface, wherein the first and second protrusions are disposed on the slider body forward of the load pivot point.
8. The disk drive of claim 7, wherein the slider body has a mid point and wherein the first and second protrusions are disposed on the slider body forward of the mid point of the slider body.
9. The disk drive of claim 8, wherein the slider body has a leading edge and wherein one of the first and second protrusions is disposed on the slider body nearer to the leading edge than the other of the first and second protrusions.
10. The disk drive of claim 8, wherein the slider body has a leading edge and wherein the first and second protrusions are disposed on the slider body substantially equally adjacent to the leading edge.
11. The disk drive of claim 7, wherein each of the first and second protrusions extend beyond the air bearing surface approximately 500 Angstroms or less.
12. The disk drive of claim 1, wherein the slider body has a leading edge step and wherein the first protrusion is disposed on the leading edge step.
13. The disk drive of claim 12, wherein each of the first protrusion extends beyond the air bearing surface approximately 500 Angstroms or less.

14. The disk drive of claim 1, further comprising a read/write head element coupled to the slider body, wherein the first protrusion has a height beyond the air bearing surface, the height being directly proportional to a distance of the read/write element from the first protrusion and a minimum specified pitch angle of operation for the slider body.

15. The disk drive of claim 2, wherein the positive pitch attitude comprises a pitch angle approximately in the range of 20 to 50 micro radians.

16. The disk drive of claim 2, wherein the positive pitch attitude comprises a pitch angle approximately in the range of 50 to 100 micro radians.

17. The disk drive of claim 2, wherein the positive pitch attitude comprises a pitch angle approximately in the range of 100 to 200 micro radians.

18. The disk drive of claim 1, wherein the protrusion extends beyond the air bearing surface a height approximately in the range of 200 to 300 Angstroms.

19. The disk drive of claim 1, wherein the protrusion extends beyond the air bearing surface a height approximately in the range of 300 to 400 Angstroms.

20. A slider, comprising:

a slider body comprising:

an air bearing surface;

a leading edge step; and

a protrusion disposed on the leading edge step of the slider body, the protrusion extending beyond the air bearing surface, and wherein the protrusion has a contoured leading edge.

21. The slider of claim 20, further comprising a read/write head element, wherein the protrusion has a height beyond the air bearing surface, the height being directly proportional to a distance of the read/write element from the protrusion and a pitch angle of the slider body.
22. The slider of claim 20, wherein the pitch angle is approximately in the range of 20 to 50 micro radians during operation of the slider in a disk drive.
23. The slider of claim 20, wherein the pitch angle is approximately in the range of 50 to 200 micro radians during operation of the slider in a disk drive.
24. The slider of claim 20, further comprising a plurality of the protrusions disposed on the leading edge step.
25. A method, comprising:
 - 1 flying a slider body with a positive pitch angle over a data zone surface of a disk;
 - 2 and
 - 3 maintaining the positive pitch angle of the slider body during contact between the slider body and the data zone surface of the disk.
26. The method of claim 25, wherein maintaining comprises maintaining the positive pitch angle to be approximately 50 micro radians or less.
27. The method of claim 25, wherein maintaining comprises maintaining the positive pitch angle to be approximately in the range of 50 to 200 micro radians.
28. The method of claim 25, wherein the positive pitch angle is maintained using at least one protrusion disposed forward of a pivot point of the head.

29. The method of claim 28, wherein a friction force is generated during contact between the slider body and the data zone surface of the disk, and wherein the method further comprises generating a counter force against a contact force using a contour of the at least one protrusion.
30. The method of claim 29, wherein the contour of the at least one protrusion is a leading edge step.
31. A method, comprising:
 - providing a slider body having a load pivot point, the slider body comprising:
 - an air bearing surface; and
 - a first protrusion extending beyond the air bearing surface, the first protrusion being disposed on the slider body forward of the load pivot point; and
 - flying the slider body in a load/unload disk drive.
32. The method of claim 31, further comprising:
 - contacting the slider body with a disk surface over a data zone; and
 - maintaining a positive pitch angle of the slider body during the contacting.
33. The method of claim 32, wherein maintaining comprises maintaining the positive pitch angle to be approximately 50 micro radians or less.
34. The method of claim 32, wherein maintaining comprises maintaining the positive pitch angle to be approximately in the range of 50 to 200 micro radians.

35. The method of claim 32, wherein a friction force is generated during the contacting between the slider body and the disk surface over the data zone, and wherein the method further comprises generating a counter force against a contact force using a contour of the first protrusion.

36. A method of designing a slider for use in a disk drive, comprising:

determining a minimum pitch angle of operation for the slider, the slider comprising a read/write element and an air bearing surface; and

determining a height of a protrusion disposed on the slider body, the height of the protrusion extending beyond the air bearing surface, wherein the height is directly proportional to a distance of the read/write element from the protrusion and the minimum pitch angle of the slider.

37. The method of claim 36, wherein determining the minimum pitch angle comprises determining the minimum pitch angle during a servo writing operation within a specification of the disk drive.

38. The method of claim 36, wherein determining the minimum pitch angle comprises determining the minimum pitch angle during high altitude operation of the slider within a specification of the disk drive.

39. The method of claim 36, wherein the height of the protrusion is determined to be approximately 500 Angstroms or less.